1. Report on the Status of Women at Rice
2. Pay It Forward
3. Shaking the Money Tree
4. Biomedical Research Careers: A Service of Innovation

Report on the Status of Women at Rice

Workshop Authors: Kathy Collins and Mikki Hebl, Rice University.

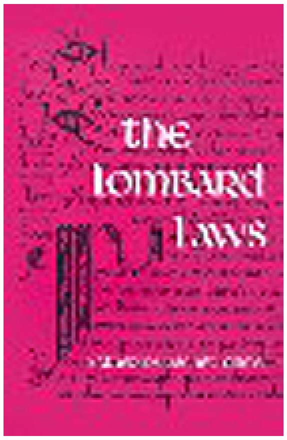
Slide 1: The Status of Women at Rice

1. History of STEM Women at Rice
2. Current Snapshot of STEM Women
3. STEM Comparisons with Other Schools
4. The 2001 Climate Survey: A Summary
5. Important Questions to Consider
6. Ongoing Research and Initiatives
7. Conclusions

Slide 2: History of Women at Rice

- Alice Crowell Dean was a teaching fellow in Math (and acting librarian) after graduating from the first class of Rice in 1916.
- It was not until 1950, that the first woman --Katherine Fischer Drew-- joined the faculty full time (History) and in 1962 was the first to achieve tenure. She graduated from Rice in 1944.

The Lombard Laws



"Places the Lombard laws in their

historical context, showing the importance of barbarian codes, the development of the Lombard policy and society in the early Middle Ages, and the use of laws as sources for these topics. . . . The translation is excellent." --- Katherine Fischer Drew, Translator (1973)

Slide 3: History of Women Faculty in Sciences and Engineering at Rice University

Women did not join the faculty full time in Science and Engineering until 1965.

- 1965: Krystyna Ansevin, assistant professor in Biology
- 1971: Mary Wheeler (Rice Phd), instructor in CAAM

- 1972: Panayota Kazakos, assistant professor in Electrical Engineering
- 1972: Kathleen Matthews, assistant professor in Biochemistry
- 1974: Meera Blattner, assistant professor in CAAM
- 1977: Yildiz Bayatizoglu, assistant professor in MEMS
- 1978: Pat Reiff, assistant professor in Space Science
- 1978: Susan Berget, assistant professor in Biochemistry

Slide 4: 15 women hired in STEM (25% of all hires) in the last 5 years (2001-06)

Natural Sciences

- Recruited 39 positions
- Offers to women: 12
- Offers to men: 29
- Filled 26 positions
    - 6 were women (23% of total hires)
    - 50% acceptance rate (women)
    - 69% acceptance rate (men)

Engineering

- Recruited 46 positions
- Offers to women: 17
- Offers to men: 42
- Filled 33 positions
    - 9 were women (27% of total hires)
    - 53% acceptance rate (women)
    - 57% acceptance rate (men)

Slide 5: History on departures in STEM

Seven women and 58 men resigned since 1992 in STEM

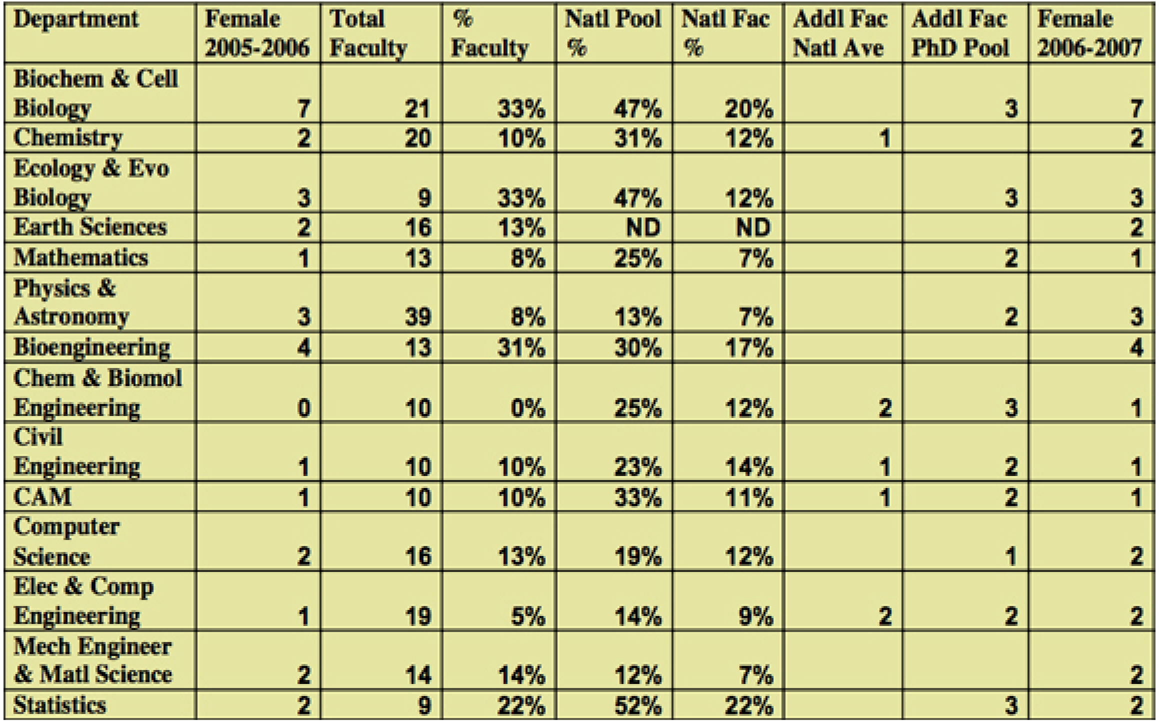
- Natural Sciences

  - Two women resigned
  - 18 men resigned

- Engineering
  - Five women resigned
  - 40 men resigned

Slide 6: A Current Snapshot

A Current Snapshot



Department	Female 2005-2006	Total Faculty	% Faculty	Natl Pool %	Natl Fac %	Addl Fac Natl Ave	Addl Fac PhD Pool	Female 2006-2007
Biochem & Cell Biology	7	21	33%	47%	20%		3	7
Chemistry	2	20	10%	31%	12%	1		2
Ecology & Evo Biology	3	9	33%	47%	12%		3	3
Earth Sciences	2	16	13%	ND	ND			2
Mathematics	1	13	8%	25%	7%		2	1
Physics & Astronomy	3	39	8%	13%	7%		2	3
Bioengineering	4	13	31%	30%	17%			4
Chem & Biomol Engineering	0	10	0%	25%	12%	2	3	1
Civil Engineering	1	10	10%	23%	14%	1	2	1
CAM	1	10	10%	33%	11%	1	2	1
Computer Science	2	16	13%	19%	12%		1	2
Elec & Comp Engineering	1	19	5%	14%	9%	2	2	2
Mech Engineer & Matl Science	2	14	14%	12%	7%			2
Statistics	2	9	22%	52%	22%		3	2

Slide 7: How does Rice STEM compare with other ADVANCE schools?

Advance Institutions	**2005 Faculty**	**2005 Women**	**2005 % Women**
Rice			
Engineering	101	13	13%
Sciences	118	18	15%
Case Western			
Engineering	115	13	11%
Sciences	126	34	27%
Columbia			
Engineering	145	12	8%
Sciences	178	26	15%
Georgia Tech			
Engineering	684	96	14%
Sciences	353	67	19%

Slide 8: Rice STEM faculty by rank

Rank	**Men**	**Women**	**% Women**

Rank	**Men**	**Women**	**% Women**
Full Professors			
Science	60	8	11.7%
Engineering	55	8	12.7%
Associate Professors			
Science	16	1	5.8%
Engineering	14	1	6.6%
Assistant Professors			
Science	24	9	27.2%
Engineering	19	4	17.4%
Total	**188**	**31**	**14.2%**

(In 2005-06, women were 16.5% of STEM faculty)

Slide 9: The 2001 Climate Survey at Rice University: A Summary

Rank	**Men**	**Women**	**Total**
Assistant Professor	30	25	55

Rank	Men	Women	Total
Associate Professor	24	21	45
Full Professor	89	15	104
Total	**143**	**61**	**204**

Number of Responses by Rank and Gender

The full roster of 466 faculty members – current as of spring 2003 – was surveyed. Approximately 204 faculty members responded, for a response rate of 46%.

Men and women responded to the survey almost in proportion to their representation on the faculty:

- ~ 24% of faculty were women
- ~ 29% of respondents were women

Note: Directly from Climate Report

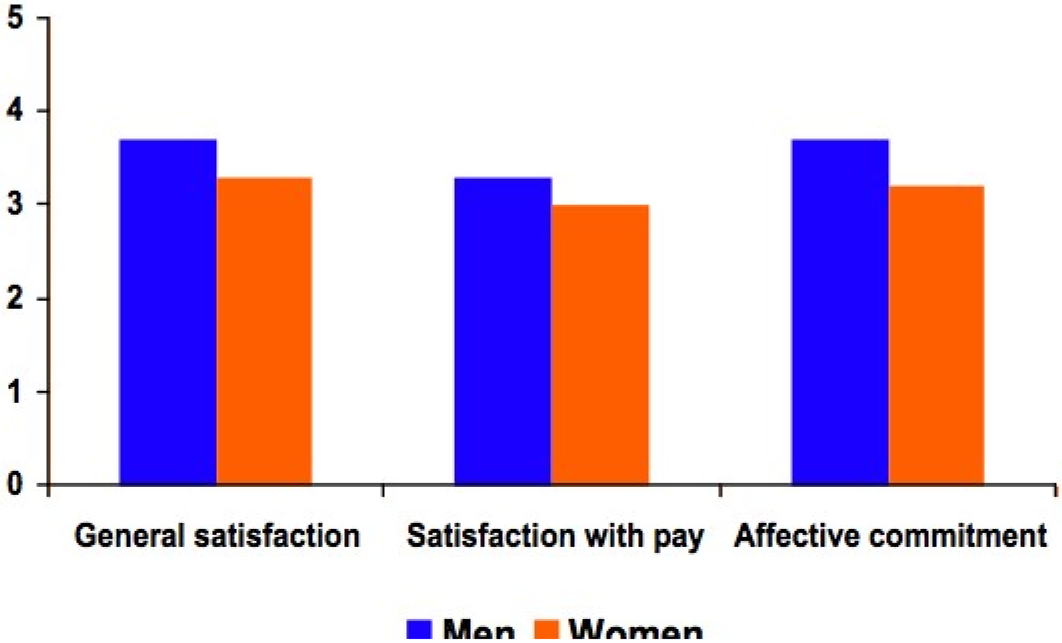
Slide 10: The 2001 Climate Survey at Rice University: Conclusions

- On many of the “objective” measures (i.e., salary, start-up), no gender differences emerge.
- There are significant differences between how male and female faculty members perceive Rice, the quality of Rice as a workplace, and their level of satisfaction with Rice.
- In almost every category, female faculty members are less satisfied with their Rice work experience, and have higher levels of active dissatisfaction.

- The differences are not enormous, but they are clearly systematic and significant.

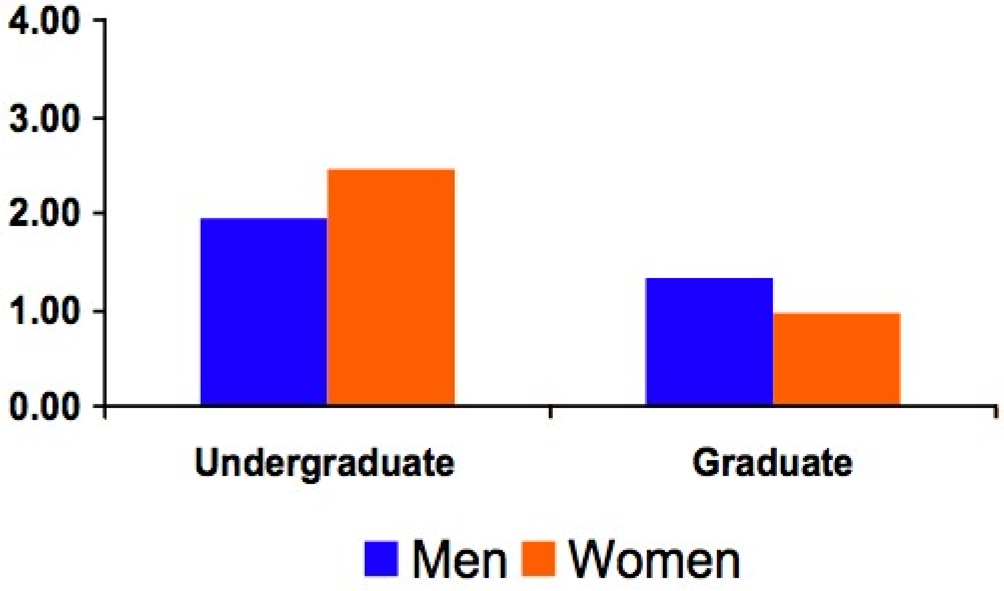
Note: Directly from Climate Report

Slide 11: Overall Faculty Satisfaction with Rice by Gender



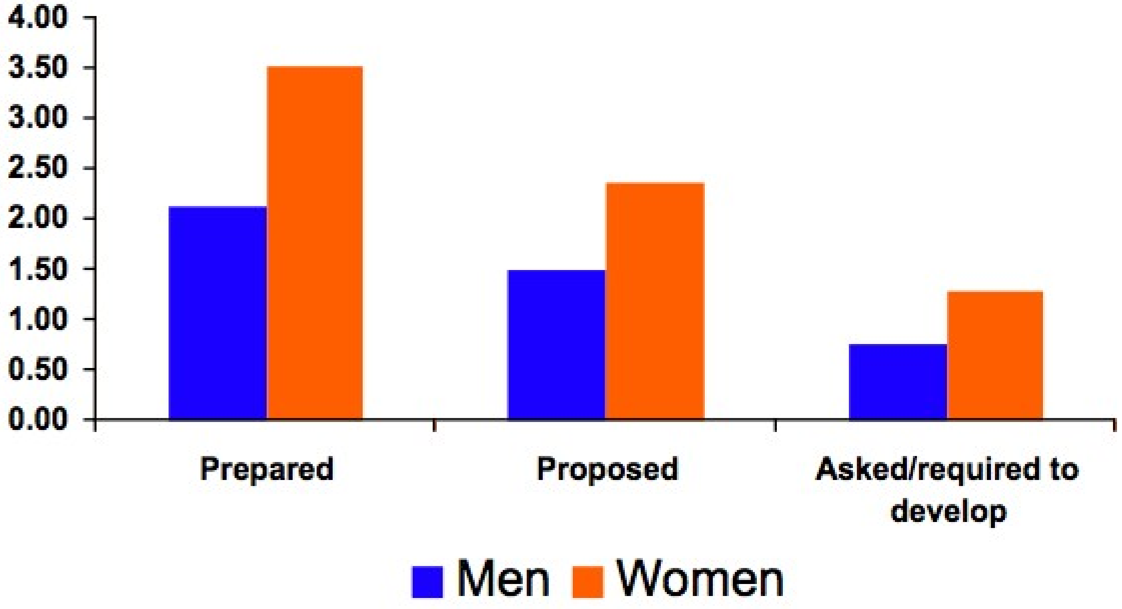
Note: Directly from Climate Report

Slide 12: Actual Teaching Load by Gender



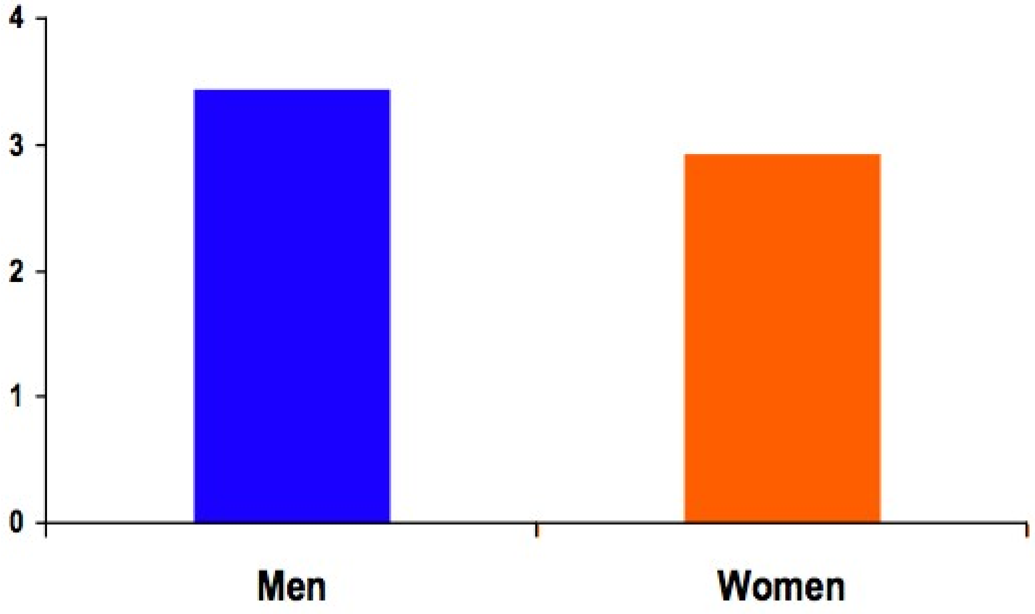
Note: Directly from Climate Report

Slide 13: New Courses by Gender Over the Past 5 Years



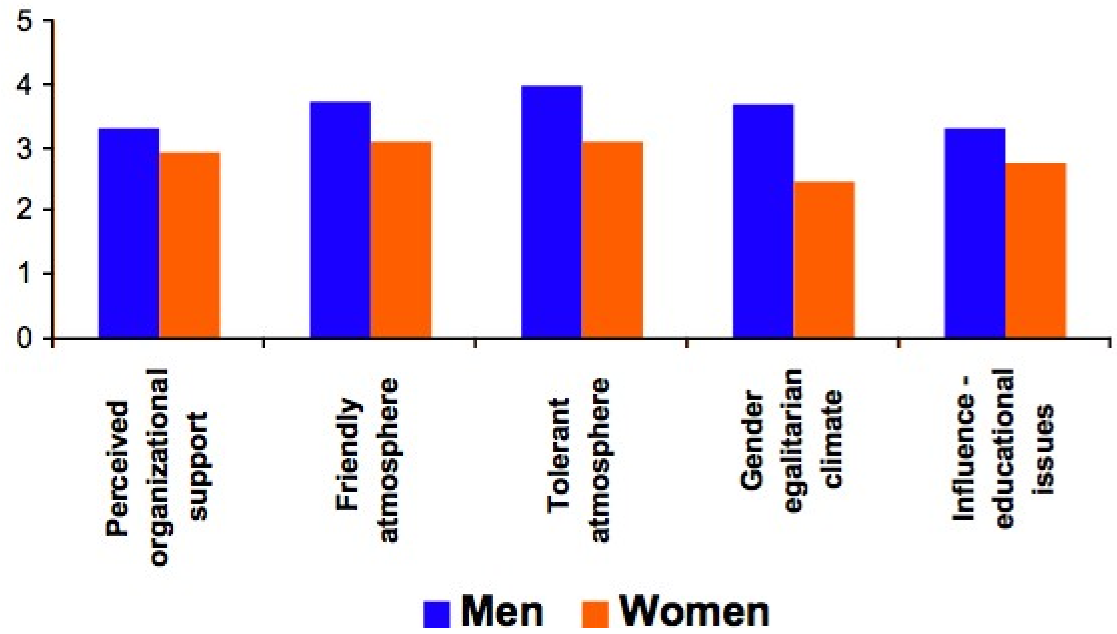
Note: Directly from Climate Report

Slide 14: Satisfaction with Distribution of Committee Responsibilities



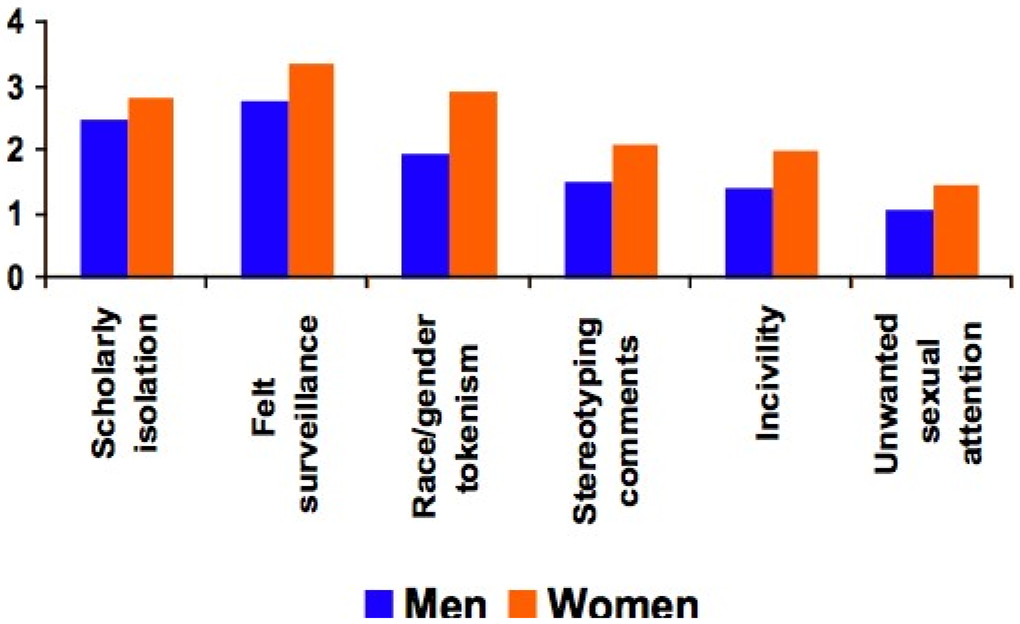
Note: Directly from Climate Report

Slide 15: Positive Climate Dimensions by Gender



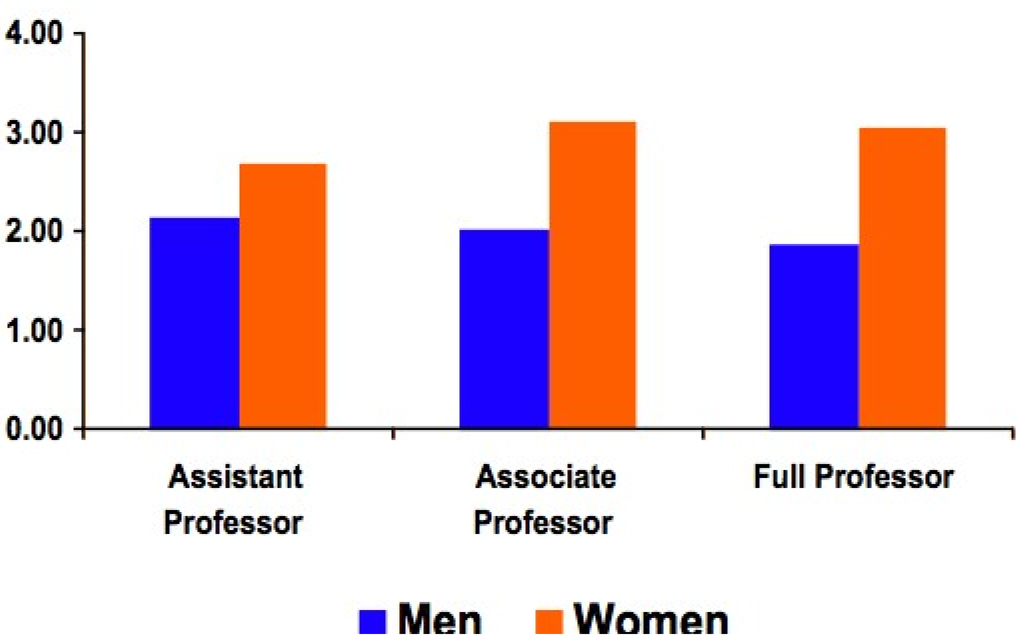
Note: Directly from Climate Report

Slide 16: Negative Climate Dimensions by Gender



Note: Directly from Climate Report

Slide 17: Perceived Tokenism by Rank and Gender



Note: Directly from Climate Report

Slide 18: Important Questions to Consider

1. How do we get more women into the STEM recruitment pool?
    - How do we increase our acceptance rates?
    - How will we know when we have done a “good job”?
2. Why do the climate differences exist?
    - Is this a general phenomenon or is it something particular about Rice University?
    - What can we do to reduce these differences and increase the positive climate that women experience? Will we see changes in our next survey (scheduled for next year)?

Slide 19: Ongoing Research and Initiatives

- Mini-Grant Competition

    - Margaret Beier, Assistant Professor of Psychology, **Predictors of Majoring in Science and Engineering**
    - Dan Beal, Assistant Professor of Psychology, **Explaining Gender Differences in High Stake Tests**

- Ongoing Projects Receiving modest ADVANCE funds ($400)

    - Juan Madera, Randi Martin, and Mikki Hebl, Psychology, **Gender Differences in Letters of Recommendation**

- Upcoming Projects that are Currently Being Designed

    - Hebl lab: **Explaining Departures from Rice University: A Gender Analysis**
    - Hebl lab: **Why People Accept or Reject STEM Offers**

Slide 20: Conclusions

1. STEM women are increasing.
2. Stark differences on the Climate Survey were not apparent - objective measures often failed to show differences although subjective measures often showed women reporting lower qualititative experiences.
3. How STEM is doing differs depending on the comparison group that we use as well as the specific department.
4. ADVANCE may already be showing some impact.
5. There are some significant objective disparities.

    - Salary disparities have diminished substantially in recent years, but there remains work to be done and vigilance to be maintained.
    - We have a lot of work to do to bring the raw numerical gender balance of our faculty to a satisfactory level. While our situation is not atypical, nor is it acceptable.

        - We confront even larger and more problematic imbalances in other dimensions – ethnicity and race – which were not the specific target of this study.

  - We have cultural and work-environment issues on the campus that need to be confronted
    - The fact that they are subliminal makes it harder.

Slide 21: A Random Sample of STEM Women

(a random sample of STEM Women)

Pay It Forward

Workshop Authors: Mikke Hebl, Rice University and Sherry E. Woods, University of Texas at Austin.

Slide 1: Outline

1. Introduction
2. Activity
3. Review of Relevant Research
4. Activity
5. Concluding Points

Slide 2: Paying It Forward

"Reuben St. Clair, the teacher and protagonist in the book "Pay It Forward," starts a movement with this voluntary, extra-credit assignment: THINK OF AN IDEA FOR WORLD CHANGE, AND PUT IT INTO ACTION. Trevor, the 12-year-old hero of "Pay It Forward," thinks of quite an idea. He describes it to his mother and teacher this way: "You see, I do something real good for three people. And then when they ask how they can pay it back, I say they have to Pay It Forward. To three more people. Each. So nine people get helped. Then those people have to do twenty-seven." He turned on the calculator, punched in a few numbers. "Then it sort of spreads out, see. To eighty-one. Then two hundred forty-three. Then seven hundred twenty-nine. Then two thousand, one hundred eighty-seven. See how big it gets?"."

"In practice the philosophy of paying it forward has broadened relative to its literary roots, and now it incorporates a more general flavor of social responsibility and desire to help others in recognition of the help one has received for one's self."

Slide 3: What Are Your Thoughts?

1. I believe it is important to be particularly supportive to the needs of women in my department, be them graduate students, postdocs, and/or colleagues.
    - A. Agree
    - B. Disagree
2. When reviewing vitas for faculty positions, I sometimes catch myself evaluating a female candidate differently than a male candidate.
    - A. Agree
    - B. Disagree
3. What would you say to this female PhD student? (April 2007)
    - "One of the reasons my advisor has encouraged me to look into a career in academia is the fact that I am female. He said that with my background and credentials, the fact that I am female should greatly increase my chances of finding a position. This is NOT what I want."
    - "I would be mortified to learn that I was hired over a male only because I was a female. I want to be recognized for my abilities and not for my sex."
4. A recent study indicates that:
    - A. Junior female scientists believe that senior female colleagues do less work and are less committed to their careers than men.
    - OR...
    - B. Senior female scientists believe that junior female colleagues do less work and are less committed to their careers than men.
5. Given the low representation of academic women in STEM, do female faculty have a responsibility or obligation to "Pay It Forward" toward other STEM women?
    - A. Yes
    - B. No

    - C. Undecided

Slide 4: Take Home Message from Activity No. 1

The majority of women asked think women should pay it forward. They should help the next generation. They should be agents of change ushering in new female STEM members and doing all they can to support them.

...So, do they?

Slide 5: Sometimes, research shows, we see the opposite of "Paying It Forward"

There is some evidence that some women who have made it do not pay forward; rather, they are harder on and tend to derogate other women.

This phenomenon has been the focus of research and has been dubbed...

Bees

Queen Bee

Slide 6: The "Queen Bee Phenomenon"

Stain, Tavris, and Jayaratne (1974) coined the term to describe a tendency for women to oppose the progress of other women in an attempt to subvert their success and eliminate competition for limited male attention.

Women may be more likely than men to discriminate against women.

Women see each other as rivals more than do men.

Ellemers (2004): "The queen-bee syndrome tends to affect older faculty members who carved out successful academic careers at a time when this was still an exceptional route for a woman. They may be inclined to fight the rise of other women through the academic "hive" to preserve their hard-won position. Queen bees identify themselves as predominantly masculine and set themselves apart from other women, the research says."

Slide 7: "Queen Bee" Relevant Research

- Broder (1993). In looking at reviews of NSF Economics proposals, female reviewers rated female-authored papers lower than they rated male-authored papers. The result still holds when controlling for institutional affiliation and experience of reviewer.
- Garcia-Retamero and Lopez-Zafra (2006). Women (but not men) rated a female candidate (with the exact same qualifications) as less qualified than the male candidate.

- Cooper (1997). Traditional women evaluate women as leaders significantly worse than do nontraditional women.
- Ellemers (2004). Female scientists believe their junior female colleagues do less work and are less committed to their careers than men, despite the fact that these women produce as much as do men.
- Toder (1980). Women evaluated women more negatively when men were present than when group was all women.
- Mathison (1986). Female managers were more critical than assertive female employees than were male managers.
- Graves and Powell (1995). Female interviewers had more reservations about hiring female applicants than did male interviewers.
- Ellemers (2001). Women were more likely to hold gender-stereotypical views of their female colleagues than were men.
- Hebl, King, and Davies (2007). Women were more likely to derogate other women if they were threatened with a lowered self-esteem manipulation.

Slide 8: The "Queen Bee Phenomenon" is more likely to occur when:

- women are evaluating people of lower status.
- women are social tokens or very underrepresented.
- women are threatened, have low self-esteem, or are insecure.
- women hold very stereotypical views about what is appropriate for women.
- Experiences?

Slide 9: Becoming aware of the "Queen Bee Phenomenon" can not only prevent its occurrence but can also trigger more actions of "paying it forward"

- This is not to suggest that women give preferential treatment to other women; just that women are mindful of the many ways that they can avoid derogating and that they can encourage other women.

Slide 10: What Are Your Experiences with "Paying It Forward"?

- Share 1 - 3 experiences you have had with Paying It Forward, either as an initiator or beneficiary...

Slide 11: What Would "Paying It Forward" Look like in Academia?

- Within the Rice STEM community?
- Within in the overall STEM community?
- For you personally?
    - As the Pay It Forward initiator?
    - As the Pay It Forward beneficiary?

Slide 12: Concluding Points

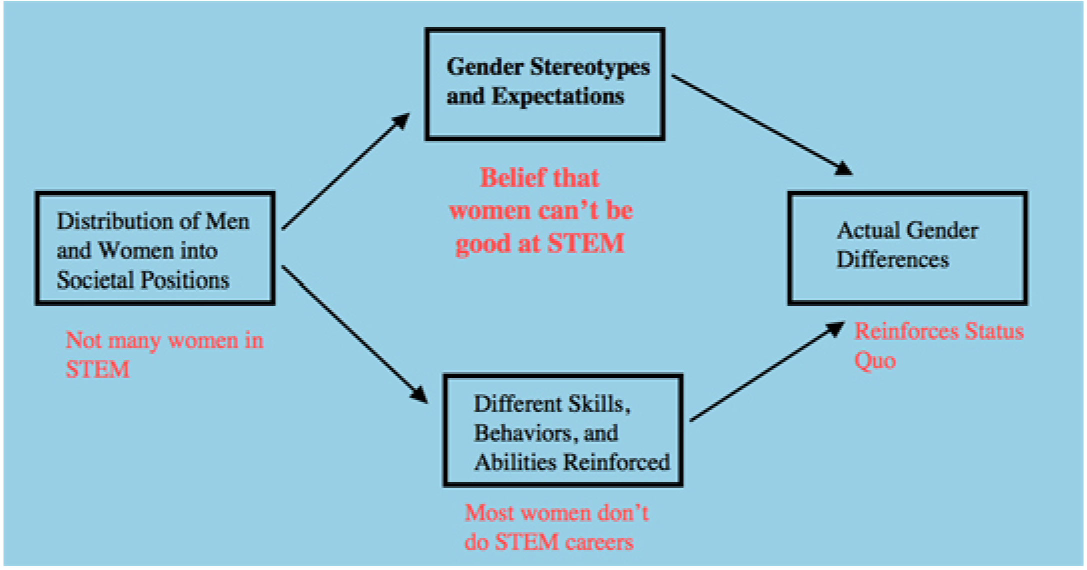
1. It will benefit women in STEM as a whole to "pay it forward" to other women.
2. The "Queen Bee" phenomenon has very detrimental effects to women as a whole.
3. Increased distributions of women into male-dominated societal positions/workforces may reduce the "Queen Bee" phenomenon.
4. As pioneering women have paid it forward for us, we have an obligation to pay it forward to future generations of women.

Slide 13: Final Conclusion

Pay it Forward!
Pay It Forward

Slide 14: The Absence of Women in STEM via Eagly (1987) Social Role Theory

Eagly's Social Role Theory



Gender Stereotypes and Expectations

Belief that women can't be good at STEM

Distribution of Men and Women into Societal Positions

Not many women in STEM

Actual Gender Differences

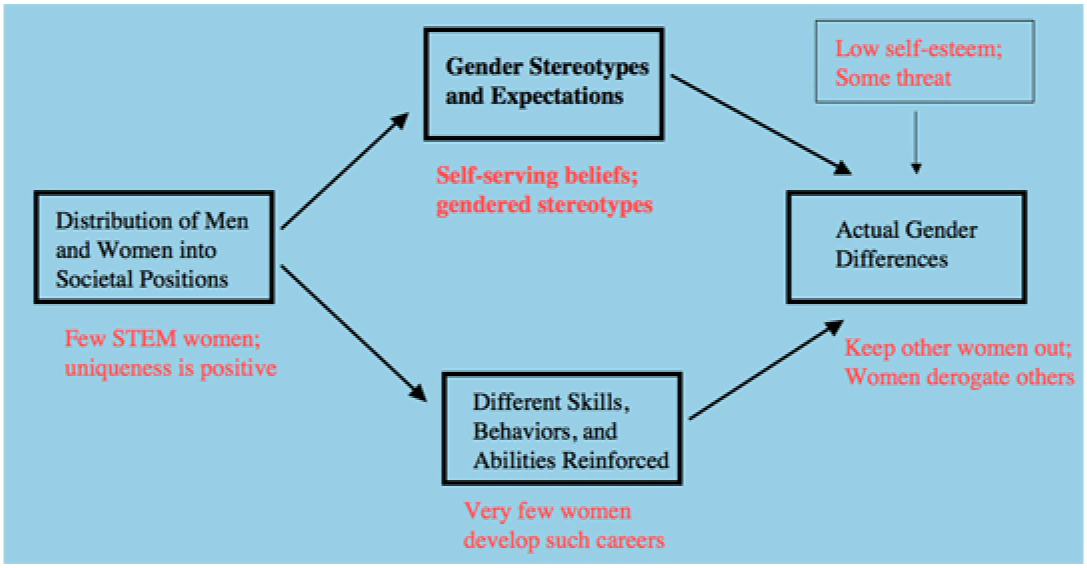
Reinforces Status Quo

Different Skills, Behaviors, and Abilities Reinforced

Most women don't do STEM careers

Slide 15: How Eagly (1987) Social Role Theory can explain the "Queen Bee Phenomenon"

Eagly's Social Role Theory



Gender Stereotypes and Expectations

Low self-esteem;
Some threat

Self-serving beliefs;
gendered stereotypes

Distribution of Men and Women into Societal Positions

Actual Gender Differences

Few STEM women;
uniqueness is positive

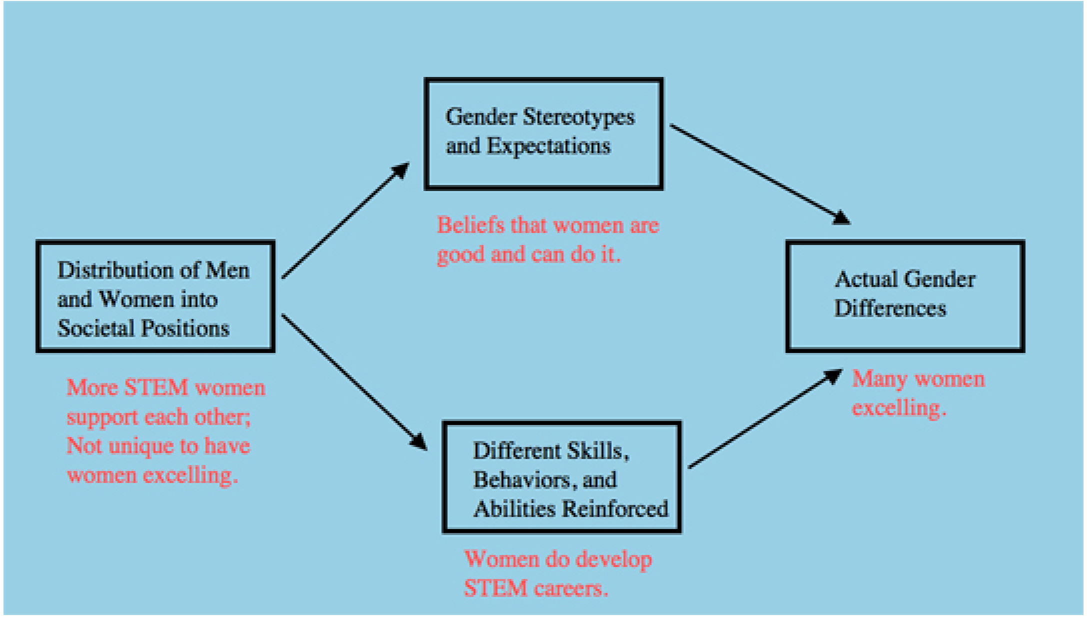
Keep other women out;
Women derogate others

Different Skills, Behaviors, and Abilities Reinforced

Very few women
develop such careers

Slide 16: Why critical mass is important

Eagly's Social Role Theory



Gender Stereotypes and Expectations

Beliefs that women are
good and can do it.

Distribution of Men and Women into Societal Positions

Actual Gender Differences

More STEM women
support each other;
Not unique to have
women excelling.

Many women
excelling.

Different Skills, Behaviors, and Abilities Reinforced

Women do develop
STEM careers.

Slide 17: "Paying It Forward" in Academia

- What's the difference between "Paying It Forward" and...
  - Good Mentoring?
  - Being a Good Friend/Colleague?

- Possible "Pitfalls" of Women "Paying in Forward"

    - Promotes stereotypical "female" behavior?
    - Indirectly "blames" women for gender discrimination?

Shaking the Money Tree

Workshop Author: Judy M. Vance, Engineering Design Program at the National Science Foundation and Mechanical Engineering, Iowa State University

Slide 1: Steps to Success

- Understand the Organization
- Contact the Program Director
- Participate on a Review Panel
- Follow the Solicitation Guidelines

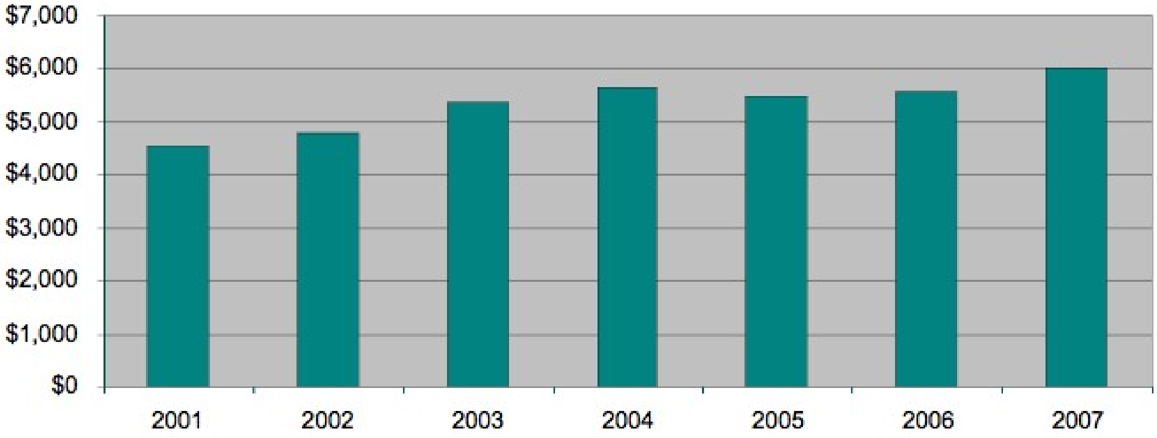
Slide 2: NSF Strategic Outcome Goals

- Discovery - research
    - Advance frontiers of knowledge
- Learning - education
    - Cultivate a world-class, broadly inclusive science and engineering workforce
    - Expand the scientific literacy of all citizens

- Research Infrastructure - facilities
    - Build the nation’s research capability through investments in advanced instrumentation
- Stewardship - accountability
    - Support excellence in science and engineering research and education through a capable and responsive organization

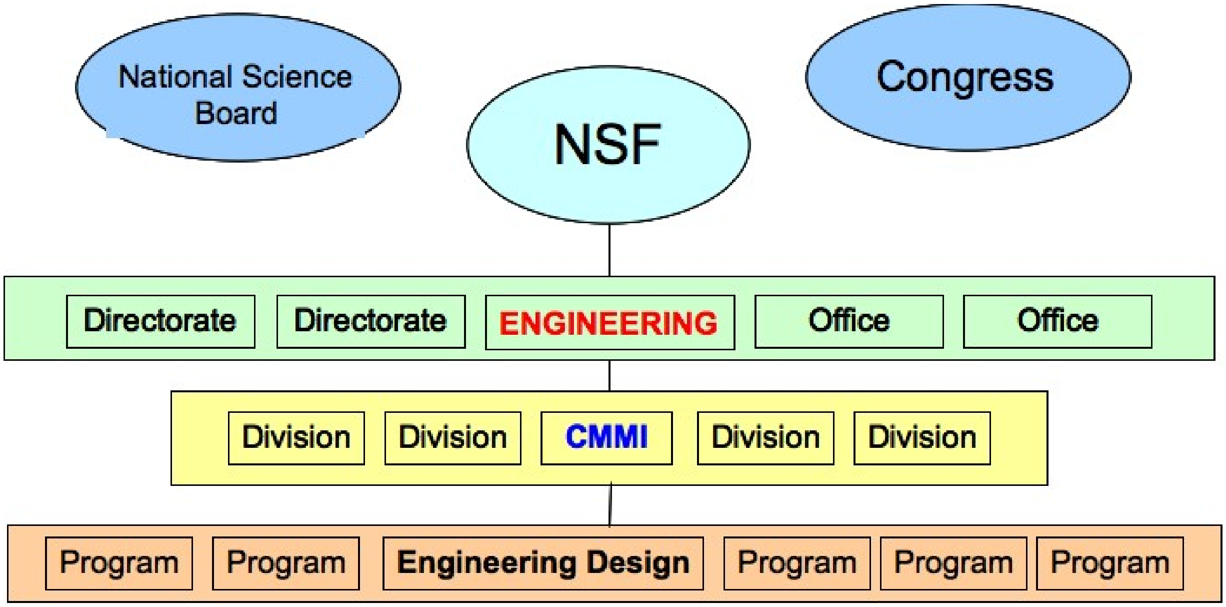
Slide 3: NSF Budget 2001-2007

(Dollars in Millions)



Slide 4: NSF Organization

NSF Organization



Slide 5: NSF Directorates

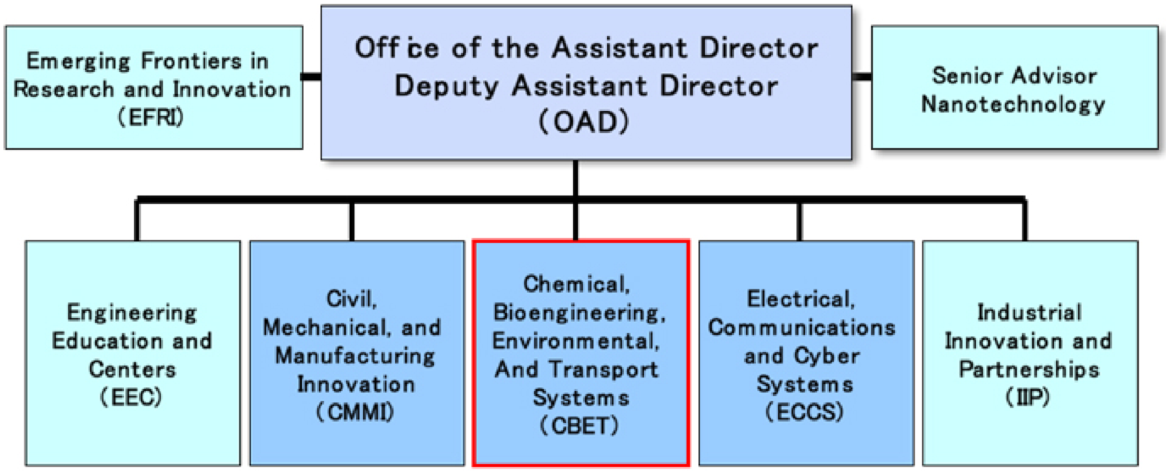
- BIO - Biological Sciences
- CISE - Computing and Information Science and Engineering
- ENG - Engineering
- GEO - Geosciences
- MPS - Mathematics and Physical Sciences
- EHR - Education and Human Resources

Slide 6: NSF Offices

- OPP - Office of Polar Programs
- OIA - Office of Integrative Activities
- OISE - Office of International Science and Engineering
- OCI - Office of Cyberinfrastructure

Slide 7: Directorate for Engineering

Directorate for Engineering



Emerging Frontiers in Research and Innovation (EFRI)

Office of the Assistant Director Deputy Assistant Director (OAD)

Senior Advisor Nanotechnology

Engineering Education and Centers (EEC)

Civil, Mechanical, and Manufacturing Innovation (CMMI)

Chemical, Bioengineering, Environmental, And Transport Systems (CBET)

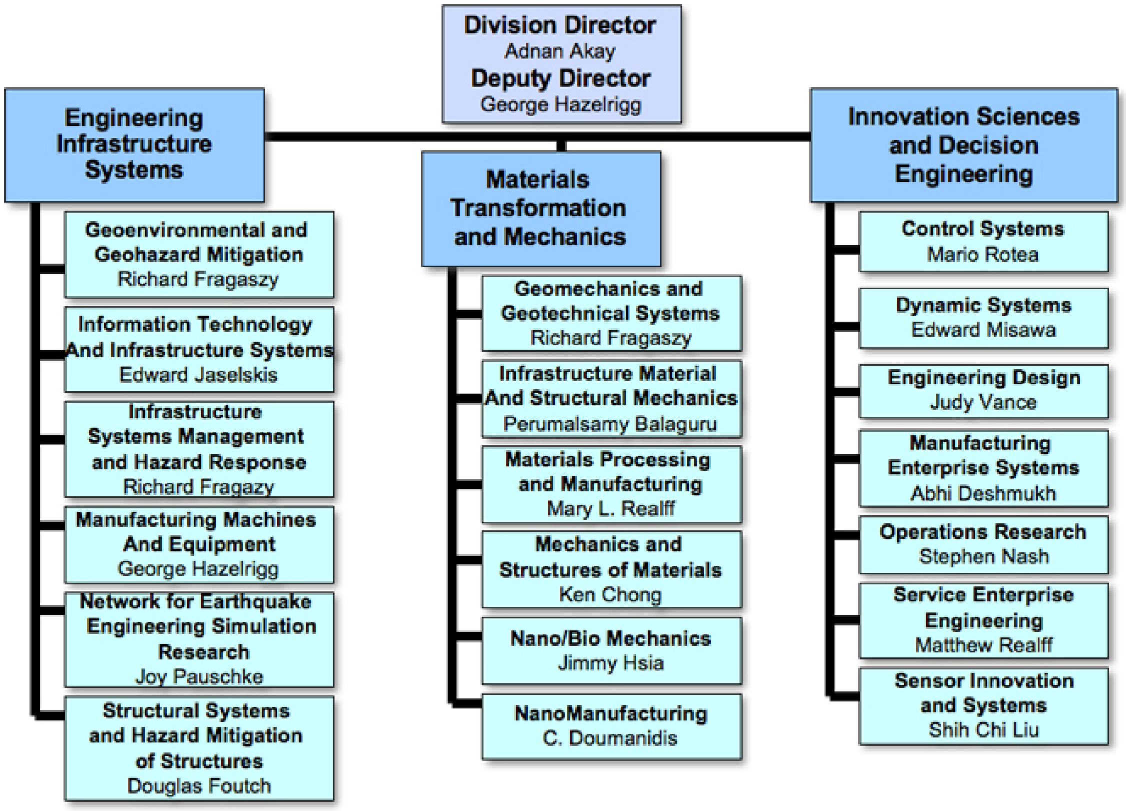
Electrical, Communications and Cyber Systems (ECCS)

Industrial Innovation and Partnerships (IIP)

FY 2007 budget is $628 Million (13% of NSF budget)

Slide 8: Civil, Mechanical, and Manufacturing Innovation

Civil, Mechanical, and Manufacturing Innovation



Division Director
Adnan Akay
Deputy Director
George Hazelrigg

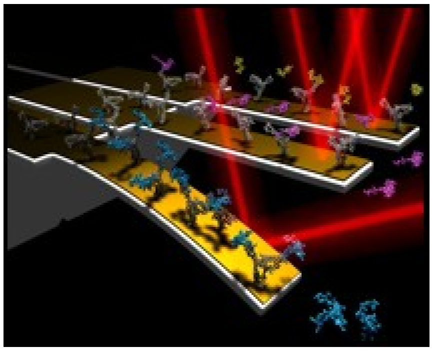
- **Engineering Infrastructure Systems**
  - **Geoenvironmental and Geohazard Mitigation** Richard Fragaszy
  - **Information Technology And Infrastructure Systems** Edward Jaselskis
  - **Infrastructure Systems Management and Hazard Response** Richard Fragazy
  - **Manufacturing Machines And Equipment** George Hazelrigg
  - **Network for Earthquake Engineering Simulation Research** Joy Pauschke
  - **Structural Systems and Hazard Mitigation of Structures** Douglas Foutch
- **Materials Transformation and Mechanics**
  - **Geomechanics and Geotechnical Systems** Richard Fragaszy
  - **Infrastructure Material And Structural Mechanics** Perumalsamy Balaguru
  - **Materials Processing and Manufacturing** Mary L. Realff
  - **Mechanics and Structures of Materials** Ken Chong
  - **Nano/Bio Mechanics** Jimmy Hsia
  - **NanoManufacturing** C. Doumanidis
- **Innovation Sciences and Decision Engineering**
  - **Control Systems** Mario Rotea
  - **Dynamic Systems** Edward Misawa
  - **Engineering Design** Judy Vance
  - **Manufacturing Enterprise Systems** Abhi Deshmukh
  - **Operations Research** Stephen Nash
  - **Service Enterprise Engineering** Matthew Realff
  - **Sensor Innovation and Systems** Shih Chi Liu

Slide 9: Civil, Mechanical, and Manufacturing Innovation

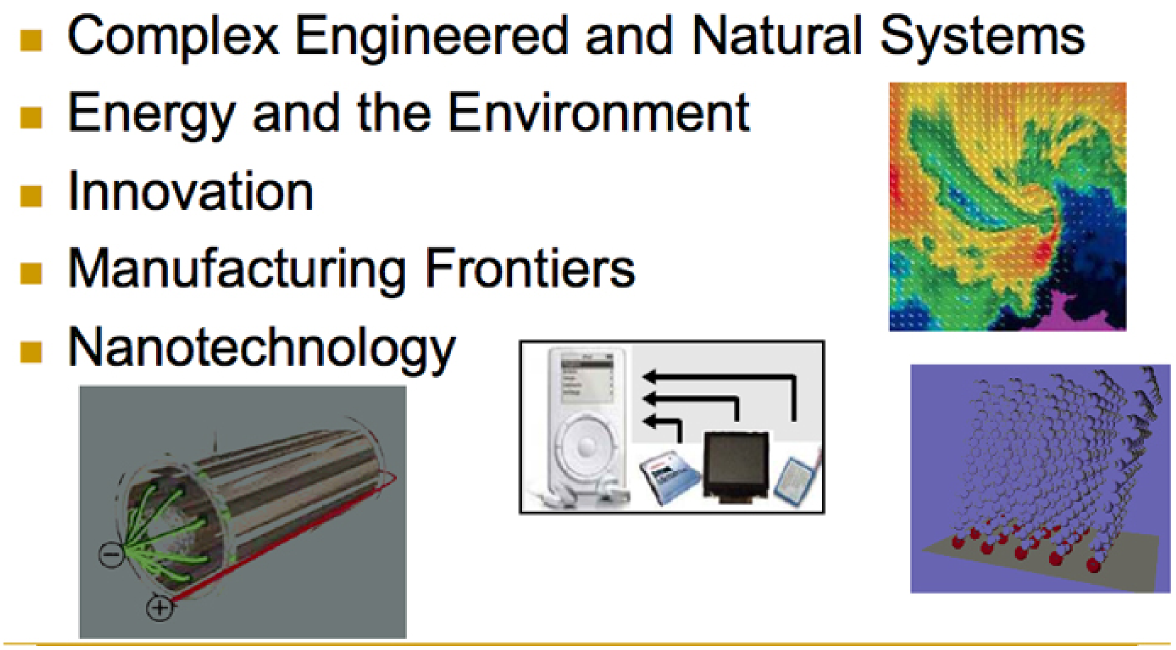
Personnel

Slide 10: Role of the Program Director

- Assess proposals
- Identify reviewers
- Conduct reviews
- Make recommendations for funding
- Identify new research areas
- Develop Solicitations



Slide 11: ENG Research and Education Themes FY 2007 – FY 2008



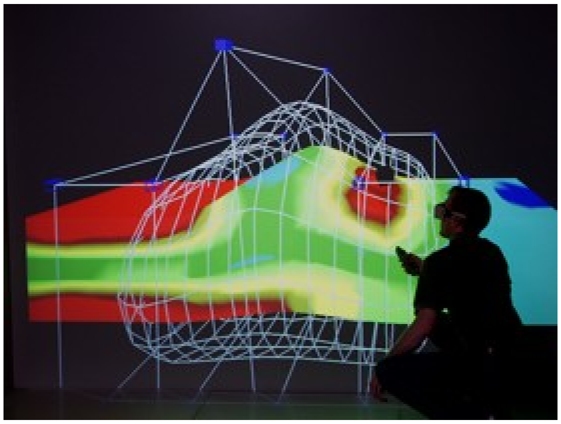
- Complex Engineered and Natural Systems
- Energy and the Environment
- Innovation
- Manufacturing Frontiers
- Nanotechnology

Slide 12: What kind of funding is available?

- Research projects
  - Typically 3 years, $100K per year
- Workshops
  - To promote discussion about leading edge research opportunities
- Small Grants for Exploratory Research (SGER)
- Research Experiences for Undergraduates (REU)
- Research Experiences for Teachers (RET)

Slide 13: Engineering Design Program

- Uncertainty
- Topology optimization
- Product Families
- Negotiation for collaborative design
- Life cycle / design for obsolescence
- Kinematics and mechanisms
- Human input to design
- Geometric modeling
- Design of experiments
- Decision based design
- Cyber infrastructure
- Consumer preferences
- Complex system / enterprise considerations / customer desires
- Advanced manufacturing



Slide 14: Engineering Design Program

- Scan-and-Solve: Direct Analysis of Acquired Models
  - V. Shapiro, I. Tsukanov: Univ of Wisc
- Computational Steering for Trade Space Exploration During Complex Systems Design
  - D. Spencer, T. Simpson, M. Yukish: Penn State
- Innovations in Product Flexibility
  - K. Wood, C. Seepersad: Univ of Texas at Austin
  - M. Wortman: TAMU
- A Biomimetic Approach to the Design of Shape-Controlled Systems
  - K. Maute: Univ of Colorado
- Augmented Lagrangian Coordination for Decomposed Design Problems
  - V. Blouin, G. Fadel, M. Wiecek: Clemson Univ

Slide 15: Proposal

- Cover Page
- Project Summary – 1 page
- Project Description – 15 pages
- References
- Biosketch – 2 pages
- Budget
- Current and Pending Work
- Facilities and Equipment

Slide 16: Merit Criteria

- Intellectual Merit
    - How important is the proposed activity to advancing knowledge and understanding?
    - How well qualified is the investigator?
    - To what extent is the proposed activity creative?
    - How well conceived and organized is the proposed activity?
    - Is there sufficient access to the necessary resources?
- Broader Impacts
    - How well does the activity advance discovery while promoting teaching, training and learning?
    - How well does the proposed activity broaden the participation of underrepresented groups?
    - To what extent will it enhance the infrastructure for research and education?
    - Will the results be disseminated broadly?
    - What may be the benefits of the proposed activity to society?

Slide 17: Peer Review Process

- Program director identifies reviewers
- Reviewers perform 6-9 proposal reviews
- Panelists come to NSF for 1-2 days to discuss and rank proposals
- Program director recommends proposals for funding

- Recommendation goes through the approval process
- PIs are notified

Slide 18: How do I write a winning proposal?

- Follow the Grant Proposal Guide (GPG)
- Follow the solicitation guidelines
- Have a clear research objective
- Have a strong research plan
- Resources should match the plan of work
- Avoid jargon
- Make every word mean something
- Pay attention to broader impacts
- Align with NSF goals/initiatives

Slide 19: Transformative Research

- Research driven by ideas that have the potential to radically change our understanding of an important existing scientific or engineering concept or leading to the creation of a new paradigm or field of science or engineering. Such research also is characterized by its challenge to current understanding or its pathway to new frontiers. ---NSB Report, March 2007

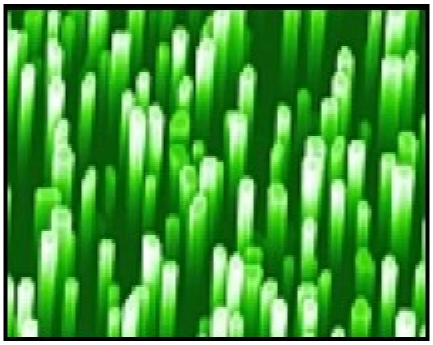
Slide 20: How do I find out about new solicitations?

- Search the NSF website
- Subscribe to MyNSF: www.nsf.gov/mynsf
- Attend workshops

Slide 21: Where to go for Information

- www.nsf.gov
- Locate people/programs
- Current solicitations
- Directorate priorities

- Abstracts of current awards
- Grant Proposal Guide



Biomedical Research Careers: A Service of Innovation

Workshop Author: Belinda Seto, Ph.D.; Deputy Director; National Institute of Biomedical Imaging and Bioengineering

Slide 1: Outline

- Why is this so fun and rewarding
- NIBIB funding opportunities
- Grant writing
- resources

Slide 2: Why is this so fun and rewarding

Slide 3: NIBIB funding opportunities

- The NIH Mission
    - NIH is the steward of medical and behavioral research for the nation. Its mission is science in pursuit of fundamental knowledge about the nature and behavior of living systems and the application of that knowledge to extend healthy life and reduce the burdens of illness and disability.

NIH Mission

NATIONAL INSTITUTES OF HEALTH

An agency of the Department of Health and Human Services, the

NIH is the Federal focal point for health research.

- The NIH ICs (27 Separate Institutes and Centers)
    - Different missions and priorities
    - Different budgets
    - Different ways of deciding which grants to fund

Slide 4: NIBIB Mission

- To improve human health by leading the development and accelerating the application of biomedical technologies. The Institute is committed to integrating the physical, engineering, and computer sciences with the life sciences to advance basic research and medical care.

NIBIB Mission

National Institute of Biomedical Imaging and Bioengineering

Slide 5: Current NIBIB Grant Portfolio Areas

- Imaging Agents and Molecular Probes
- Image Displays
- Image Guided Therapies and Interventions
- Image Perception
- Image Processing
- Magnetic, Biomagnetic and Bioelectric Devices
- Magnetic Resonance Imaging and Spectroscopy
- Nuclear Medicine
- Optical Imaging and Spectroscopy
- Ultrasound and Acoustics
- X ray, Electron and Ion Beam
- Biosensors
- Biomaterials
- Biomechanics
- Biomedical Informatics
- Computational Biology
- Drug and Gene Delivery Systems
- Lab-on-a-chip Technologies
- Medical Devices and Implant Science
- Nanotechnology
- Rehabilitation Engineering
- Surgical Tools and Techniques
- Telemedicine
- Tissue Engineering

Slide 6: How is NIBIB different?

- Design- and needs-driven research, as well as hypothesis-driven
- Focus on enabling technologies with broad applications to multiple diseases or biological processes
- Multi-disciplinary and collaborative research
- Inter-agency and inter-institute activities

HHMI – NIBIB
Interface Initiative for
Interdisciplinary Graduate Research Training

January 10, 2005

Illustration: Randy Lyhus
Channel image: Courtesy of Rapoport Laboratory

Slide 7: NIBIB-HHMI Interfaces Initiative (Phase I)

- Reduce existing barriers to interdisciplinary graduate education:
  - Develop integrated courses, laboratory experiences, and other education mechanisms for trainees from different scientific backgrounds
  - Promote academic and administrative institutional change that facilitates interdisciplinary graduate study
  - Produce set of ‘best practices’ on how to modify existing academic and administrative structures to facilitate interdisciplinary education

Slide 8: Program Focus

- NJIT/Rutgers/NJMS – Neuroscience
- JHU - Nanotechnology
- UCI – Systems Biology (Molecular-Population)
- UCSD – Systems Biology (Molecular-Organismal)

- UPenn - Imaging Informatics
- Brandeis – Systems Biology (Molecular-Population)
- CMU/UPitt – Imaging Informatics, Structural Biology
- UChicago – Biocomplexity (Molecular-Population)
- UCSF – Systems Biology (Molecular-Cellular)
- UNM – Biocomplexity (Molecular-Population)

Slide 9: Interfaces Initiative Transition Plan

- Phase I (3+ years)
    - January, 2005 – Program Announcement
    - November, 2005 – Phase I awards
- Phase II (5 years)
    - June, 2008 - Receipt date
    - September/October, 2008 - Scientific review
    - January, 2009 – Advisory Council review
    - March/April, 2009 – First Awards

Slide 10: Interfaces Initiative (Phase II)

- Relationship to Strategic Plan:
    - This initiative will support the NIBIB commitment to interdisciplinary research training by providing student support for new institutional training programs designed to reduce existing barriers to interdisciplinary graduate education.
- Initiative Response:
    - We expect all 10 of the funded Phase I programs to respond to this initiative. We also anticipate that other interdisciplinary training programs, including new programs and programs that applied for but did not receive Phase I funding, to respond to this

initiative. We will not permit our existing T32 training programs to respond to this initiative.

Slide 11: Training-related Awards

Mechanism	Awards	Total
Diversity Supplements	23	$1,268,281
Residency Supplements	8	$1,057,507
Re-entry Supplements	---	---
R13 Conference Support	14	$210,000
R15 AREA Awards	5	$1,031,833
Loan Repayment	2	$147,556

Training-related Awards

Slide 12: Inter-agency Partnerships

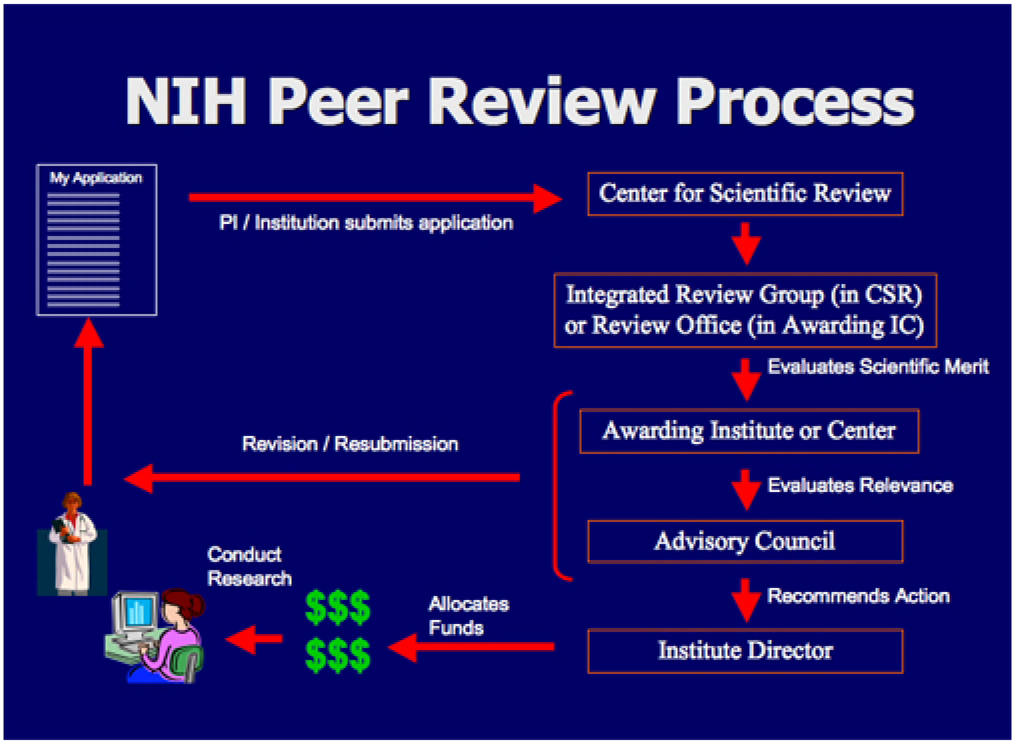
Mechanism	Awards	Trainees	Total

Mechanism	**Awards**	**Trainees**	**Total**
NIBIB-HHMI Interfaces Initiative	10	~100	FY2009
Bioengineering and Bioinformatics Summer Insts. (BBSI)	13	~175	$784,500
Biomed. Eng. Summer Intern Program (BESIP)	---	17	$115,000
NIH-NIST Fellowship Program	---	4	$338,250
Meyerhoff Fellowship	---	5	$300,000

Inter-agency Partnerships

Slide 13: Grant Writing

NIH Peer Review Process



NIH Peer Review Process

My Application

PI / Institution submits application

Center for Scientific Review

Integrated Review Group (in CSR) or Review Office (in Awarding IC)

Evaluates Scientific Merit

Awarding Institute or Center

Evaluates Relevance

Advisory Council

Recommends Action

Institute Director

Allocates Funds

$$$
$$$

Conduct Research

Revision / Resubmission

Slide 14: General NIH Review Criteria

- Significance
- Approach
- Innovation
- Investigator
- Environment

Slide 15: What reviewers REALLY want to know

- The significance of what you are proposing
- That your approach is appropriate
- That you can do what you propose

Slide 16: Why Is Good Grant Writing So Important?

- Reviewers are very busy people
- Committees review many grants

- Reviewers have a very limited amount of time to make the case for your grant
- Even in times of plenty, there are more meritorious applications than can be paid

Slide 17: Resources

Christine Kelley	kelleyc@mail.nih.gov
Brenda Korte	kortebr@mail.nih.gov
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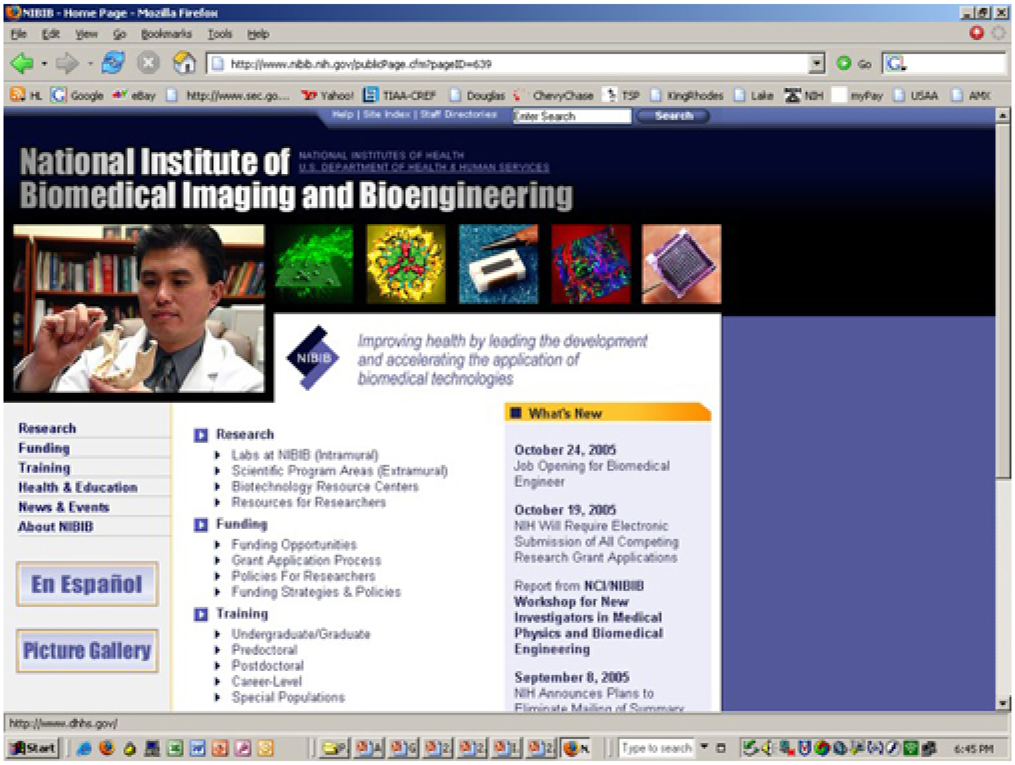
Rosemarie Hunzinger	hunzinr@mail.nih.gov
Alan McLaughlin	mclaugal@mail.nih.gov
John Haller	hallerj@mail.nih.gov
Hector Lopez	lopezh@mail.nih.gov
Yantian Zhang	yzhang1@mail.nih.gov
John Anderson	andersj@mail.nih.gov
Richard Baird	bairdr@mail.nih.gov

NIBIB Scientific Program Staff

Inside the NIH Grant Review Process

- Mock Study Section Video
- http://www.csr.nih.gov/video/video.asp

NIBIB Website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U.S. DEPARTMENT OF HEALTH & HUMAN SERVICES
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Training
Health & Education
News & Events
About NIBIB
En Español
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National Institute of Biomedical Imaging and Bioengineering

Improving health by leading the development and accelerating the application of biomedical technologies

Research
- Labs at NIBIB (Intramural)
- Scientific Program Areas (Extramural)
- Biotechnology Resource Centers
- Resources for Researchers

Funding
- Funding Opportunities
- Grant Application Process
- Policies For Researchers
- Funding Strategies & Policies

Training
- Undergraduate/Graduate
- Predoctoral
- Postdoctoral
- Career-Level
- Special Populations

What's New

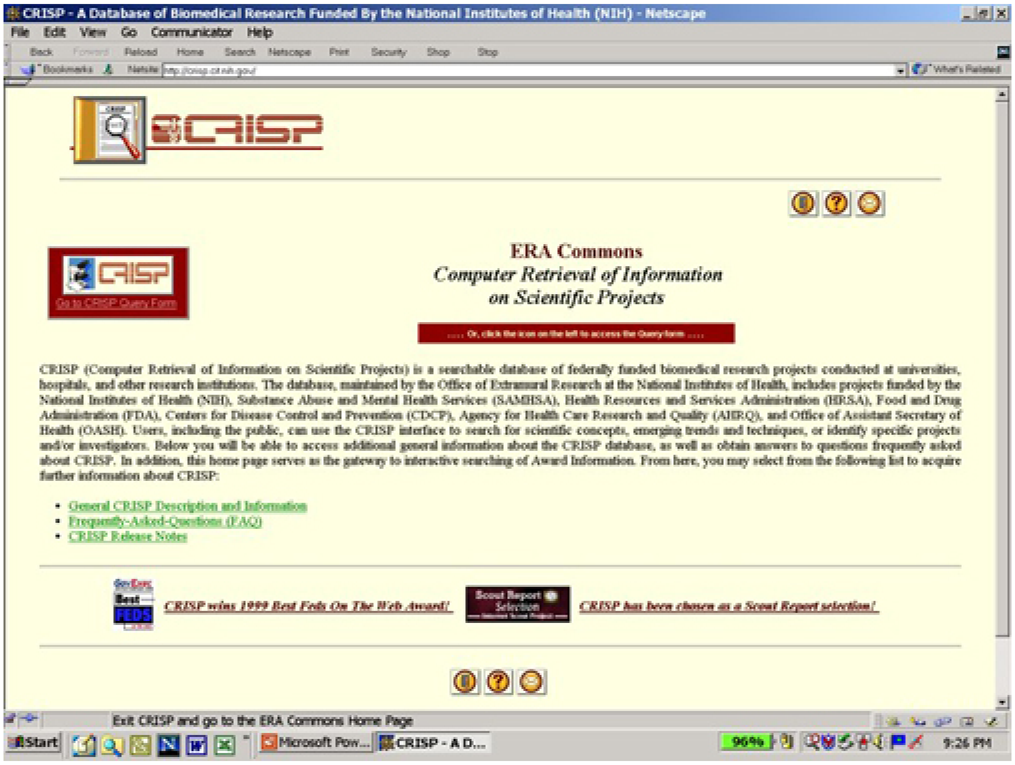
October 24, 2005
Job Opening for Biomedical Engineer

October 19, 2005
NIH Will Require Electronic Submission of All Competing Research Grant Applications

Report from **NCI/NIBIB Workshop for New Investigators in Medical Physics and Biomedical Engineering**

September 8, 2005
NIH Announces Plans to Eliminate Mailing of Summary

CRISP Website



CRISP - A Database of Biomedical Research Funded By the National Institutes of Health (NIH) - Netscape

Go to CRISP Query Form

ERA Commons
Computer Retrieval of Information on Scientific Projects

.... Or, click the icon on the left to access the Query form ....

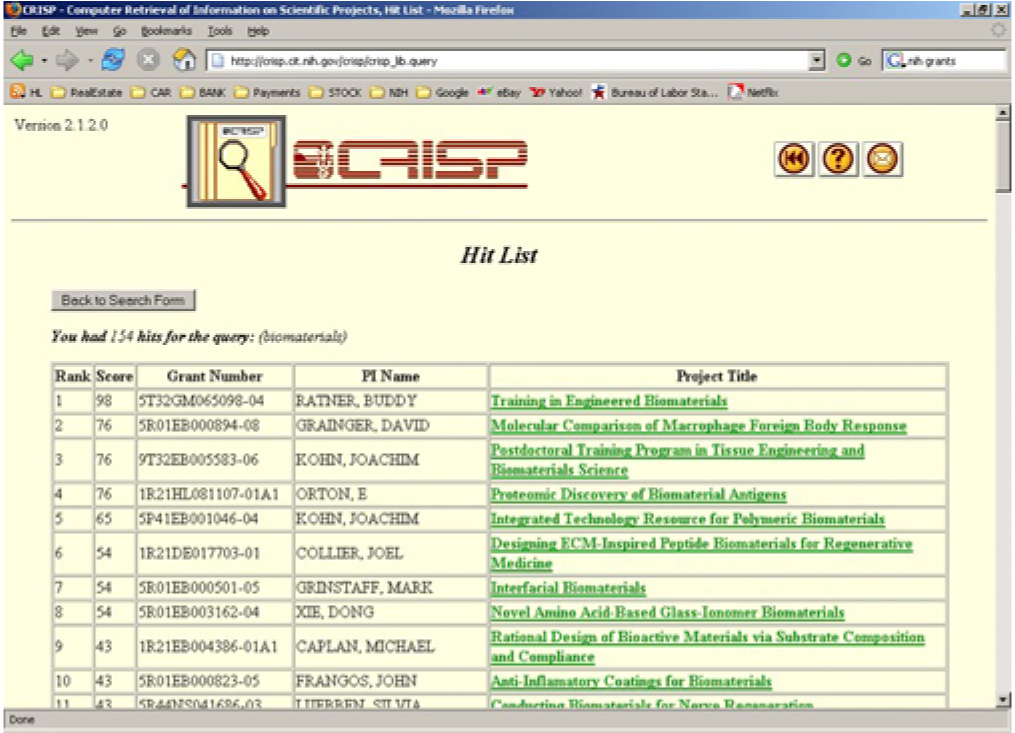
CRISP (Computer Retrieval of Information on Scientific Projects) is a searchable database of federally funded biomedical research projects conducted at universities, hospitals, and other research institutions. The database, maintained by the Office of Extramural Research at the National Institutes of Health, includes projects funded by the National Institutes of Health (NIH), Substance Abuse and Mental Health Services (SAMHSA), Health Resources and Services Administration (HRSA), Food and Drug Administration (FDA), Centers for Disease Control and Prevention (CDCP), Agency for Health Care Research and Quality (AHRQ), and Office of Assistant Secretary of Health (OASH). Users, including the public, can use the CRISP interface to search for scientific concepts, emerging trends and techniques, or identify specific projects and/or investigators. Below you will be able to access additional general information about the CRISP database, as well as obtain answers to questions frequently asked about CRISP. In addition, this home page serves as the gateway to interactive searching of Award Information. From here, you may select from the following list to acquire further information about CRISP:

- General CRISP Description and Information
- Frequently-Asked-Questions (FAQ)
- CRISP Release Notes

CRISP wins 1999 Best Feds On The Web Award! *CRISP has been chosen as a Scout Report selection!*

Exit CRISP and go to the ERA Commons Home Page

CRISP Web Query



CRISP - Computer Retrieval of Information on Scientific Projects, Hit List - Mozilla Firefox

http://crisp.cit.nih.gov/crisp/crisp_lib.query

Version 2.1.2.0

Hit List

You had 154 hits for the query: (biomaterials)

Rank	Score	Grant Number	PI Name	Project Title
1	98	5T32GM065098-04	RATNER, BUDDY	Training in Engineered Biomaterials
2	76	5R01EB000894-08	GRAINGER, DAVID	Molecular Comparison of Macrophage Foreign Body Response
3	76	9T32EB005583-06	KOHN, JOACHIM	Postdoctoral Training Program in Tissue Engineering and Biomaterials Science
4	76	1R21HL081107-01A1	ORTON, E	Proteomic Discovery of Biomaterial Antigens
5	65	5P41EB001046-04	KOHN, JOACHIM	Integrated Technology Resource for Polymeric Biomaterials
6	54	1R21DE017703-01	COLLIER, JOEL	Designing ECM-Inspired Peptide Biomaterials for Regenerative Medicine
7	54	5R01EB000501-05	GRINSTAFF, MARK	Interfacial Biomaterials
8	54	5R01EB003162-04	XIE, DONG	Novel Amino Acid-Based Glass-Ionomer Biomaterials
9	43	1R21EB004386-01A1	CAPLAN, MICHAEL	Rational Design of Bioactive Materials via Substrate Composition and Compliance
10	43	5R01EB000823-05	FRANGOS, JOHN	Anti-Inflamatory Coatings for Biomaterials
11	43	5R44NS041686-03	LUEBBEN, SILVIA	Conducting Biomaterials for Nerve Regeneration

Slide 18: Conclusion

“To give away money is an easy matter and in any man’s power. But to decide to whom to give it, and how much and when, and for what purpose and how, is neither in every man’s power nor an easy matter. Hence, it is that such excellence is rare, praiseworthy, and noble.” ---Aristotle